We are asked to determine the intersection of two lines L_1 and L_2, each defined parametrically as

$$L_1 : \begin{cases} x = 8 + 2s \\ y = 16 + 4s \\ z = 20 + 6s \end{cases} \quad \text{and} \quad L_2 : \begin{cases} x = -4 + 3t \\ y = -8 + 6t \\ z = -18 + 10t. \end{cases}$$

We should first determine whether or not the lines are parallel. We can do this by looking at the direction vectors for each line, given by

$$L_1 : < 2, 4, 6 > \quad \text{and} \quad L_2 : < 3, 6, 10 > .$$

Since there is no such number c such that

$$< 2c, 4c, 6c > = < 3, 6, 10 >,$$

we can conclude that the lines are not parallel. They either intersect or are skew.

We now want to determine the values of s and t such that

$$\begin{aligned} 8 + 2s &= -4 + 3t \\ 16 + 4s &= -8 + 6t \\ 20 + 6s &= -18 + 10t. \end{aligned}$$

From the first equation, we can determine that

$$t = \frac{12 + 2s}{3}.$$

Plugging this into the t in the second equation gives us $s = s$, which is not helpful at all, so we will substitute t into the third equation to get

$$\begin{aligned} &20 + 6s = -18 + 10\left(\frac{12 + 2s}{3}\right) = -18 + \frac{120 + 20s}{3} \\ &60 + 18s = -54 + 120 + 20s \Rightarrow 2s = -6 \\ &\Rightarrow s = -3. \end{aligned}$$

From this we can determine

$$t = \frac{12 + 2(-3)}{3} = 2.$$

By using $s = -3$ and $t = 2$, we can substitute back into L_1 and L_2 to see that the two lines intersect at $(2, 4, 2)$.